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[ABSTRACT]

This paper investigates the impact of foreign firms on exports of domestic exporting firms. We show that domestic firms respond to an increase in the presence of foreign firms by increasing their exports, despite the increase in foreign presence can drive up the production cost and make domestic market more profitable. This hypothesis is then tested in China, where we find a 1 per cent increase in foreign presence causes domestic firms to increase their exports by 0.74 per cent. This finding sheds light on understanding China's massive exports and fast inflow of foreign investment observed in the past three decades.

[KEY WORDS]

Export, Foreign Firm, FDI, Spillovers, China

[JEL CLASSIFICATION]

D21, F10, L20

1. Introduction

Researchers have long been searching for driving forces of firm exporting behavior, for example theoretically from the classical absolute and comparative advantage theory and Heckscher-Ohlin model to the 'new trade theory' associated with Krugman (1979). More recently, pioneered by Melitz (2003), the firm heterogeneity has been incorporated to explain why some firms export while others not, even though they are in the same industry (see David Greenaway and Richard Kneller, 2007 for a survey). There also exist a number of empirical studies that focus on different countries, to name a few, Aitken, Hanson, and Harrison (1997) on Mexico, Roberts and Tybout (1997) on Colombia, Clerides, Lach, and Tybout (1998) on Colombia, Mexico, and Morocco, Bernard and Jenson (1999, 2004) on the US, Greenaway, Sousa, and Wakelin (2004) and Kneller and Pisu (2007)on the UK, Gorg, Henry, and Strobl (2008) on Ireland, and Sun (2009) on China.

Different from these studies, this paper intends to investigate the impact of an increase in the presence of foreign firms on domestic exporting firms' export quantity in China. It has been widely recognized that foreign firms can positively affect domestic firms, either through the forward and backward linkage, the labor mobility, or the imitation and competition effect (see Magnus Blomstrom and Ari Kokko, 1998 for a survey). The positive spillovers from foreign firms will affect domestic firms' export behavior. As will be shown later, an increase in the presence of foreign firms can generate an increase in domestic exports, even if the increase in foreign presence also brings in such negative impact as driving up the production cost and making domestic market more lucrative. This paper focuses on China, which on the one hand is one of the largest exporting countries and on the other hand is one of largest recipients for

foreign investment. Understanding the impact of foreign firms on domestic export quantity will enable a better understanding, from a microeconomic perspective, of China's exports and subsequently its massive trade surplus.

The remainder of the paper is organized as follows. Section 2 establishes a simple partial equilibrium model to examine the impact of foreign firms, and lays down the hypothesis for later empirical exercise. We then set up the econometric specification, describe the data, and construct variables in section 3. Section 4 discusses the empirical results and section 5 concludes.

2. Export Quantity in the Presence of Spillovers

In an industry where firms sit in an interval [0,1], firms located in $[0,\gamma]$ are foreign firms and firms located in $(\gamma,1]$ are domestic firms. Thus the γ denotes the presence of foreign firms in the industry. All firms are homogenous and can sell their products at both the domestic and foreign markets. At the domestic market, firms play Cournot game, and have an inverse demand function as follows:

$$p = p(Q),\ p_Q < 0$$

where Q is the aggregate domestic sales and

$Q = \int_0^1 (q_i - e_i)di = \int_0^\gamma (q_i - e_i)di + \int_\gamma^1 (q_j - e_j)dj$, q denotes the firm output, e denotes the exports, and p_Q represents the derivative of p with respect to Q. The world market is a competitive market, and firms are faced with world price P.

In the course of production and exporting, costs are incurred respectively. For the production process, firm i's cost function is $C\left(q_i, \int_0^\gamma q_j dj\right)$ with $C_1 > 0$, $C_2 > 0$,

$C_{22} < 0$, and $C_{12} < 0$, where the subscripts 1 and 2 denote the derivatives with respect to the first and second arguments of the production cost function respectively. The foreign firms' activities drive up the production cost ($C_2 > 0$), for example increasing the average wage in the industry. Meanwhile the presence of foreign firms also creates productivity spillovers to other firms, which has been confirmed by a number of empirical studies, particularly in China for example Liu (2008), Buckley, Clegg and Wang (2007), Chuang and Hsu (2004), Liu (2002), and Li (2001). The $C_{12} < 0$ captures productivity spillovers. An increase in foreign firm activities reduces the marginal production cost.

Firm i's export cost function is $E = E\left(e_i, \int_0^{\gamma} q_j dj\right)$ with $E_1 > 0$, $E_{11} > 0$, $E_2 < 0$, $E_{22} < 0$, and $E_{12} < 0$. $E_1 > 0$ and $E_{11} > 0$ show that firms' export cost is increasing in its export quantity at an increasing speed. $E_2 < 0$ and $E_{22} < 0$ show that for a given export quantity, the export cost is decreasing in foreign firms' activities in the industry, subject to a decreasing speed. Similar to the production cost, the presence of foreign firms also reduces the marginal export cost ($E_{12} < 0$). Foreign firms will have better knowledge on foreign markets regarding the customer preference, packaging requirements, and technical standards. Such knowledge can spill over to other firms and thus reduce the fixed cost of exporting. The higher the foreign presence in the industry, the easier and more effective one firm can mimic the exporting behavior of foreign firms. Hence, the presence of foreign firms in the industry reduces not only the total export cost but also the marginal export cost.

Firm i's problem is to choose its output and export quantities to maximize its profit, given all the other firms' output and export decisions, as follows:

$$\max_{\{q_i, e_i\}} \Pi_i = (q_i - e_i) p\left(\int_0^1 (q_i - e_i) di \right) + e_i P - C\left(q_i, \int_0^\gamma q_j dj \right) - E\left(e_i, \int_0^\gamma q_j dj \right)$$

Then domestic firms' first order conditions (FOCs) are:

$$p + (q_i - e_i) p_Q - C_1 = 0$$

$$- p - (q_i - e_i) p_Q + P - E_1 = 0$$

Foreign firms' FOCs are:

$$p + (q_j - e_j) p_Q - C_1 - C_2 - E_2 = 0$$

$$- p - (q_j - e_j) p_Q + P - E_1 = 0$$

By symmetry, all domestic firms choose the same output and export quantities, and all foreign firms choose the same output and export quantities. Let domestic firms' choice be (q_d, e_d) and foreign firms' choice be (q_f, e_f). The FOCs become:

$$p + (q_d - e_d) p_Q - C_{1,d} = 0 \quad (1)$$

$$- p - (q_d - e_d) p_Q + P - E_{1,d} = 0 \quad (2)$$

$$p + (q_f - e_f) p_Q - C_{1,f} - C_{2,f} - E_{2,f} = 0 \quad (3)$$

$$- p - (q_f - e_f) p_Q + P - E_{1,f} = 0 \quad (4)$$

where $C_{1,d}$ and $E_{1,d}$ are the first derivative of the production and export cost functions with respect to its first argument respectively, evaluated at domestic firms' output and export quantities, and $C_{1,f}$, $C_{2,f}$, $E_{1,f}$ and $E_{2,f}$ are those evaluated at foreign firms' choice.

Add equation (1) to equation (2) and equation (3) to equation (4), we obtain:

$$P - C_{1,d} - E_{1,d} = 0 \tag{5}$$

$$P - C_{1,f} - C_{2,f} - E_{1,f} - E_{2,f} = 0 \tag{6}$$

The first observation about equations (5) and (6) is that $(q_d, e_d) \neq (q_f, e_f)$, namely domestic firms and foreign firms have different equilibrium choices of output and export quantities, which occurs due to the asymmetric impact of foreign presence on the production and export costs. Furthermore, if foreign firms have same output as domestic firms, namely $q_f = q_d$, then foreign firms will always export more than their domestic counterparts. This point can be shown by plugging $q_d = q_f$ into equations (5) and (6):

$$E_{1,d} - E_{1,f} - E_{2,f} - C_{2,f} = 0$$

which implies $E_{1,d} < E_{1,f}$ as $E_{2,f} < 0$ and $C_{2,f} < 0$. Since $E_{11}^{"} > 0$, $e_d < e_f$.

Total differentiate equations (5) and (6) with respect to *e* and γ, holding q_d and q_f constant, we can obtain:

$$\frac{de_d}{d\gamma} = -\frac{C_{12,d} + E_{12,d}}{E_{11,d}} q_f > 0$$

$$\frac{de_f}{d\gamma} = -\frac{C_{12,f} + C_{22,f} + E_{12,f} + E_{22,f}}{E_{11,f} + E_{12,f}} q_f$$

which shows that for an increase in the foreign presence γ, domestic firms will increase their exports, while in contrast foreign firms' decision is undetermined and depends on how their activities affect the marginal export cost.

An increase in the foreign presence, γ, will affect firms through three channels: first it reduces the exporting cost and thus makes exporting more profitable; second, it drives up the production cost, reducing the overall profit; third, since the equilibrium choices of domestic and foreign firms are different from each other, a change in the foreign presence will create a demand side shock as $dQ/d\gamma = (q_f - q_d) + (e_d - e_f) \neq 0$.

If $q_d = q_f$, an increase in γ will reduce the aggregate domestic sales and thus increase the domestic price, making the domestic market more profitable. For domestic firms, the first channel dominates the second and third channels.

In the model, we assume both domestic firms and foreign firms share the same production and export cost functions. However if we allow for the possibility that they are different, namely the production and export cost functions for domestic firms being $C^d\left(q_i, \int_0^\gamma q_j dj\right)$ and $E^d\left(e_i, \int_0^\gamma q_j dj\right)$ respectively and those for foreign firms being $C^f(q_i)$ and $E^f(e_i)$ respectively with similar assumptions on the first, second and cross derivatives, then the results of the model remain unchanged.

3. Econometric Specification and the Data

It is shown in section two that domestic firms respond to an increase in the presence of foreign firms by increasing their export quantity due to the presence of positive spillovers. To test this hypothesis, we set up the following econometric specification:

$$\begin{aligned}\ln(EXPORTS_{it}) = {} & \lambda_0 + \lambda_1 \ln(firmsize_{it}) + \lambda_2 \ln(lp_{it}) + \lambda_3 age_{it} + \lambda_4 \ln(k_{it}) + \\ & \lambda_5 \ln(averagewage_{it}) + \lambda_6 ownership_{it} + \lambda_7 herfindahl_{it} + \\ & \lambda_8 oic_{it} + \lambda_9 lec_{it} + \lambda_{10} sei_{it} + \lambda_{11} fp_{it} + \\ & \lambda_{12} dindustry_i + \lambda_{13} dyear_t + \alpha_i + \varepsilon_{it}\end{aligned} \tag{7}$$

where the subscripts *i* and *t* denotes domestic firm and year respectively; *EXPORTS* is domestic firms' exports; *firmsize*, *lp*, *age*, *k*, *averagewage*, *ownership*, *herfindale*, *oic*, *lec*, *sei*, and *fp* denote the firm size, labor productivity, firm age, capital intensity, average wage, ownership structure, Herfindahl index, overall industry concentration, local export concentration, relative total domestic exports, and foreign presence respectively; *dindustry* and *dyear* are two sets of two-digit industry and year dummies that control for the industry fixed effect and time varying effect respectively; α_i is the firm fixed effect, and ε denotes the i.i.d. normal error term.

The foreign presence (*fp*) is the variable of interest and is constructed as the share of foreign firms' output in the four-digit industries, $fp = \sum_{i \in I} y_i \Big/ \sum_{j \in J} y_j$, where *y* denotes firm output, *I* denotes the set of foreign firms in the industry, *J* denotes the set of all firms in the industry, and $I \subset J$. A significant and positive estimate of its coefficient indicates that an increase in the foreign presence leads to an increase in the export quantity, thus confirming the hypothesis.

While we intend to examine the impact of foreign firms on domestic firms' export quantity, we meanwhile control for other factors that affect firm export quantity. Selected according to previous studies, for example Aitken et al. (1997), Greenaway et al. (2004), and Sun (2009), the control variables include firm characteristics (the firm size, productivity, age, capital intensity, average wage, and ownership structure) and industry variables (the Herfindahl index, overall industry concentration, local export concentration, and relative total domestic exports).

Recent empirical and theoretical literature has shown that more productive and efficient firms export more successfully as they are more capable of meeting the fixed entry cost of exporting and overcoming other export barriers (Andrew B. Bernard and J. Bradford Jensen, 1999, Sofronis K. Clerides, Saul Lach and James R. Tybout, 1998, Gorg et al. 2008, Marc J. Melitz, 2003). Hence we expect the firm size, productivity, capital intensity, and average wage to positively affect the export quantity. The firm size is measured by the number of employees. The labor productivity is equal to value added per worker. The capital intensity and average wage are equal to the fixed assets and total salary divided by the number of employees respectively. We also include the firm age as a control variable to account for the impact of both experience and late-comer advantage. In China on the one hand, older firms may have more exporting experience and thus tend to export more, while on the other hand younger firms may just been established to serve foreign markets. Since these two channels exert contrasting impact, we do not have prior expectation on the coefficient of the firm age. The ownership structure (*ownership*) is a dummy variable that takes a value of 1 if the firm is non-state and collectively owned, which controls for the different export behavior between these two types of firms. In China, on the one hand it is easier for the state and collectively owned firms to finance their export activities and thus easier for them to overcome the fixed entry cost; on the other hand privately owned firms are usually more competitive in the market.

In addition to the firm characteristics that affect export quantity, firms belonging to different industries may have different export quantities, even when they are same as each other in all other aspects. This possibility is controlled by the industry variables.

The Herfindahl index, which is the sum of squared firm domestic market share, captures the impact of market structure. In a more concentrated market, on the one hand firms that enjoy domestic market power and have less incentive to explore the world market, and on the other hand these firms tend to be big and are more capable of exporting. The overall industry concentration (*oic*) is equal to the province-industry (four digit) share of national industry employment divided by the province share of national manufacturing employment, while the local export concentration (*lec*) is equal to the province-industry (four digit) share of national industry exports divided by the province share of national manufacturing exports. These two variables are included to control for the possibility that firms located in an industry with concentrated manufacturing and exporting activities are more likely to export (B. Aitken, H. G. Hanson and A. E. Harrison, 1997) and tend to export more. It is also likely that foreign firms tend to locate themselves into industries with high exports, which if not controlled will lead to the endogeneity problem. Hence, as in Greenaway et al. (2004), we include the relative total domestic exports, which is equal to the total domestic exports in a four-digit industry divided by the total national domestic exports, to control for the potential endogeneity.

We then employ a firm level balanced panel data set, which covers 3,300 domestic firms from 2000 to 2007[1], to estimate the impact of foreign firms on domestic exports. The panel data are constructed from a comprehensive micro data set that covers China's 'above designated size' firms and accounts for over 85 per cent of China's industrial output. China National Bureau of Statistics annually collects these data to compile the 'Industry' section of the *China Statistical Yearbook*. Similar data from

[1] The 2001 and 2004 data are not available.

the same source have been used to study other aspects of Chinese industrial economy, for example, Hu, Jefferson, and Qian (2005) in the R&D and technology transfer, Jefferson, Thomas, and Zhang (2008) in the productivity growth, and Sun (2009) in the export spillovers of foreign direct investment.

Following Jefferson et al. (2008), we clean the data set by excluding firms (1) that employ less than eight workers as they may not have reliable accounting systems, (2) that report negative net values of fixed assets, non-positive outputs, value added, and wages, and (3) that are located in the upper and lower tails (more than four standard deviations from the mean) of the productivity distribution. Then we deflate all monetary variables, such as the value added, to 2000 price using the producer price index for manufactured goods obtained from *China Statistical Yearbook 2008*. The industry variables, such as the foreign presence and Herfindahl index, are constructed over the cleaned and deflated data set. After constructing all variables in equation (7), we then extract a balanced panel data set where all firms have export records. Creating a balanced panel data set allows us to avoid the complication of the impact of firm entry and exit. All firms in the sample having export records allows us to avoid the firm's decision on whether to export and focus on the decision on how much to export. Table 1 presents the descriptive statistics of variables used in estimation.

<insert Table 1 here>

4. Empirical Results

4.1 The estimation strategy

There exists potential endogeneity in estimating equation (7). First, while the more productive firms tend to export more, the exporting experience will at the same time improve their productivity level. Second, even though we include the relative total domestic exports (*sei*) to control for the possibility that foreign firms tend to locate themselves into industries with high exports, we may still fail to fully control for this effect. Both of these lead to the endogeneity problem that needs to be addressed in the estimation. In consideration of this, we adopt the following estimation strategy: (a) first assume both the labour productivity and foreign presence are exogenous and apply a fixed effect estimator to estimate equation (7); (b) then account for the potential endogeneity problem by applying an instrumental variable (IV) estimator. An endogeneity test is then carried out to determine which estimation is more appropriate.

In step (a), it is possible that the idiosyncratic error term in equation (7) is serially correlated and heteroskedastic. We thus conduct the Wooldridge (2002) test and a modified Wald test to check for the AR(1) autocorrelation and groupwise heteroskedasticity respectively. The Wooldridge test regresses the residuals, calculated from the regression of the first-differenced variables, against their one-period lags, and under the null hypothesis of no AR(1) autocorrelation the coefficient estimated is -0.5, which can be tested using the usual *t* statistic. The Wooldridge test is shown by Drukker (2003) to have good size and power properties with a reasonable sample size, and is therefore applicable to our context since we have nearly 20 thousands observations. The test statistic obtained is 71.94 with a p-value of 0. For the modified Wald test, the test statistic obtained is 4.6×10^{6} with a p-value of 0. Thus the two tests reject the null hypothesis of no AR(1) autocorrelation and homoskedasticity

respectively at the 5 per cent level. Due to the existence of the autocorrelation and heteroskedasticity, we calculate the heteroskedaticity and autocorrelation robust standard errors in the estimation, using a procedure provided by Schaffer (2007).

In step (b), we carry out the IV estimation using the Schaffer (2007) procedure, where we use the one-year lagged labour productivity, foreign presence, and number of firms in the four digit industry as the instruments, and calculate the heteroskedasticity and autocorrelation robust standard errors since there is evidence of heteroskedasticity and autocorrelation in the step (a). We conduct a feasible efficient two-step generalized method of moments (GMM) IV estimation. The GMM IV estimation is more efficient than the two-step least square IV estimation if there exist heteroskedasticity and autocorrelation (C. F. Baum et al., 2007). Since the instruments need to be relevant (correlated with the endogenous variables), we check the relevance of the instruments by examining the fit of the first stage regression. In the first stage regression, the Bound, Jaeger, and Baker (1988) partial R-square and the Shea (1997) partial R-square are both 0.24 for the foreign presence and 0.09 for the labour productivity, and the *F* statistic for the joint significance of the instruments is 179.82 with a p-value of 0 for the foreign presence and 83.05 with a p-value of 0 for the labour productivity. Therefore the instruments are relevant. The instruments also need to be valid (uncorrelated with the error terms). As the number of instruments exceeds the number of endogenous variables, we are able to test the validity of instruments as an overidentification test, using the Hansen (1982) *J* statistic, which is χ^2 distributed with degrees of freedom equal to the number of overidentifying restrictions. The *J* statistic obtained is 1.74 with a p-value of 0.19. Hence at the 5 per

cent significance level, we fail to reject the null hypothesis of orthogonality between the instruments and the error terms.

Finally we need to determine whether the step (a) or step (b) is more appropriate. This is done by an endogeneity test, namely using the *C* statistic (Martin S. Eichenbaum, Lars Peter Hansen and Kenneth J. Singleton, 1988, F. Hayashi, 2000) to test the orthogonality of the endogenous variables. We obtain a *C* statistic of 24.01 with a p-value of 0, which rejects the null hypothesis of orthogonality of the endogenous variable at the 5 per cent level. Thus we conclude that the GMM IV estimator is more appropriate to estimate equation (7).

4.2 The impact of foreign firms on domestic exports

Table 2 reports the estimation results, with the first column presenting the estimation at the step (a) and the second column presenting the estimation at the step (b). Since we have determined the step (b) is more appropriate, the following interpretations will be based on the step (b), while the step (a) is presented for the sake of comparison.

The estimated coefficient of foreign presence is 0.74 with a *t* statistic of 2.79, which is significant at the 5 per cent level. Hence a 1 per cent increase of the foreign presence will encourage domestic exporting firms to increase their export quantity by 0.74 per cent. In the past three decades, China's rapid growth in exports has been coupled with a fast inflow of foreign direct investment. From 1991 to 2007, the average actually-utilized foreign direct investment is as high as 43.5 billion US dollars, with an average annual growth rate of 26 per cent. In the same period, the exports grow at 20 per cent

per annum on average, and the average exports are 356 billion US dollars. The correlation between the exports and inflow of foreign direct investment is as high as 0.8. The positive and significant estimate of the coefficient of foreign presence confirms that one contribution to this close relationship is foreign firms' positive impact on exports of domestic firms. Despite the inflow of foreign direct investment can drive up the production cost, benefitting from the positive productivity spillovers and export market information dissemination, domestic exporting firms respond by increasing their exports.

<insert Table 2 here>

The estimated coefficients for the control variables are largely consistent with our expectation. The firm size, productivity, and average wage are found to significantly and positively affect export quantity, indicating that more efficient and productive firms export more. The capital intensity has no significant impact on the exports. The firm age turns out not to significantly affect the export quantity, as the estimated coefficient is insignificant at the 5 per cent level, indicating that the late-comer advantages of younger firms cancel out with the importance of experience of older firms. The coefficient of ownership structure is negative and significant at the 10 per cent level, implying that the state and collectively owned firms export more than their privately owned counterparts. This is more or less surprising as we would expect private firms are more competitive in the market, but nevertheless can occur if for the firms in our sample, financing in the process of export is important. The state and collectively owned firms in China have better financing capacity than their privately owned counterparts due to the fact of being state and collectively owned.

The impact of overall industry concentration is found to be positive and significant at the 5 per cent level. A firm that is located in an industry with more concentrated manufacturing activities exports more than a firm that is not. In contrast, the local export concentration appears not to have the same impact as its estimated coefficient is insignificant. The market structure, captured by the Herfindahl index, also appears not to significantly affect the export quantity. Belonging to a more export-oriented industry boosts their export quantity, which is confirmed by the positive and significant estimate of the coefficient of the relative total domestic exports.

5. Concluding Remarks

We explore the impact of foreign firms on the export quantity of domestic exporting firms. Due to positive spillovers from foreign firms, domestic firms respond to an increase in the presence of foreign firms by increasing their exports, despite the increase in foreign presence can drive up the production cost and make domestic market more profitable. This hypothesis is then tested using a rich firm level balanced panel data set in China. Our results suggest that a 1 per cent increase in foreign presence brings in 0.74 per cent increase in domestic exports, which, from a micro perspective, sheds light on understanding China’s massive exports and fast inflow of foreign direct investment observed in the past three decades.

Table 1 Descriptive Statistics

Variables	Mean	Std. Dev.	Min	Max
ln(EXPORTS	9.86	1.52	1.39	17.72
ln(firm size)	-1.00	1.26	-4.61	5.09
ln(labour productivity)	3.71	0.88	-1.52	7.82
firm age	21.44	19.69	1	408*
ln(capital intensity)	3.54	1.17	-4.54	8.21
ln(average wage)	2.43	0.52	-4.67	5.12
Herfindahl index	0.02	0.07	0.001	8.56
overall industry concentration	40.59	150.43	0.03	7060.22
local export concentration	145.20	1159.21	0.001	61758.06
relative total domestic exports	0.01	0.02	0.0000003	0.10
foreign presence	0.37	0.18	0	0.99
ownership	0.38			

Note: * Two firms that produce traditional Chinese medicine report a history dated back to the 15th century.

Table 2 Estimation Results

	(a)			(b)		
Variables	Coefficient	Std. Err.	t	Coefficient	Std. Err.	t
ln(firm size)	0.80*	0.02	44.16	0.88*	0.04	24.29
ln(labour productivity)	0.400*	0.0100	29.98	0.69*	0.07	9.78
age	-0.0005	0.0008	-0.62	-0.001	0.001	-1.06
ln(capital intensity)	0.05*	0.01	4.28	0.01	0.02	0.48
ln(average wage)	0.17*	0.020	9.27	0.07**	0.04	1.66
ownership	-0.06*	0.02	-2.93	-0.06**	0.06	-1.74
Herfindahl index	-0.01	0.04	-0.28	0.05	0.05	0.93
oic	0.00008	0.00007	1.11	0.0003*	0.0001	2.17
lec	-0.000003	0.00001	-0.31	0.000004	0.00002	0.21
sei	8.20*	0.65	12.63	9.41*	1.25	7.53
foreign presence	0.38*	0.08	4.96	0.74*	0.26	2.79
industry dummies	yes			yes		
year dummies	yes			yes		
Centered R-square	0.30			0.25		
F statistic	111.27			27.78		
No. of Obs	19793			9900		

Note: (a) is the FE estimation without instruments; (b) is the GMM IV estimation; * denotes significance at the 5 per cent level; ** denotes significance at the 10 per cent level.

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